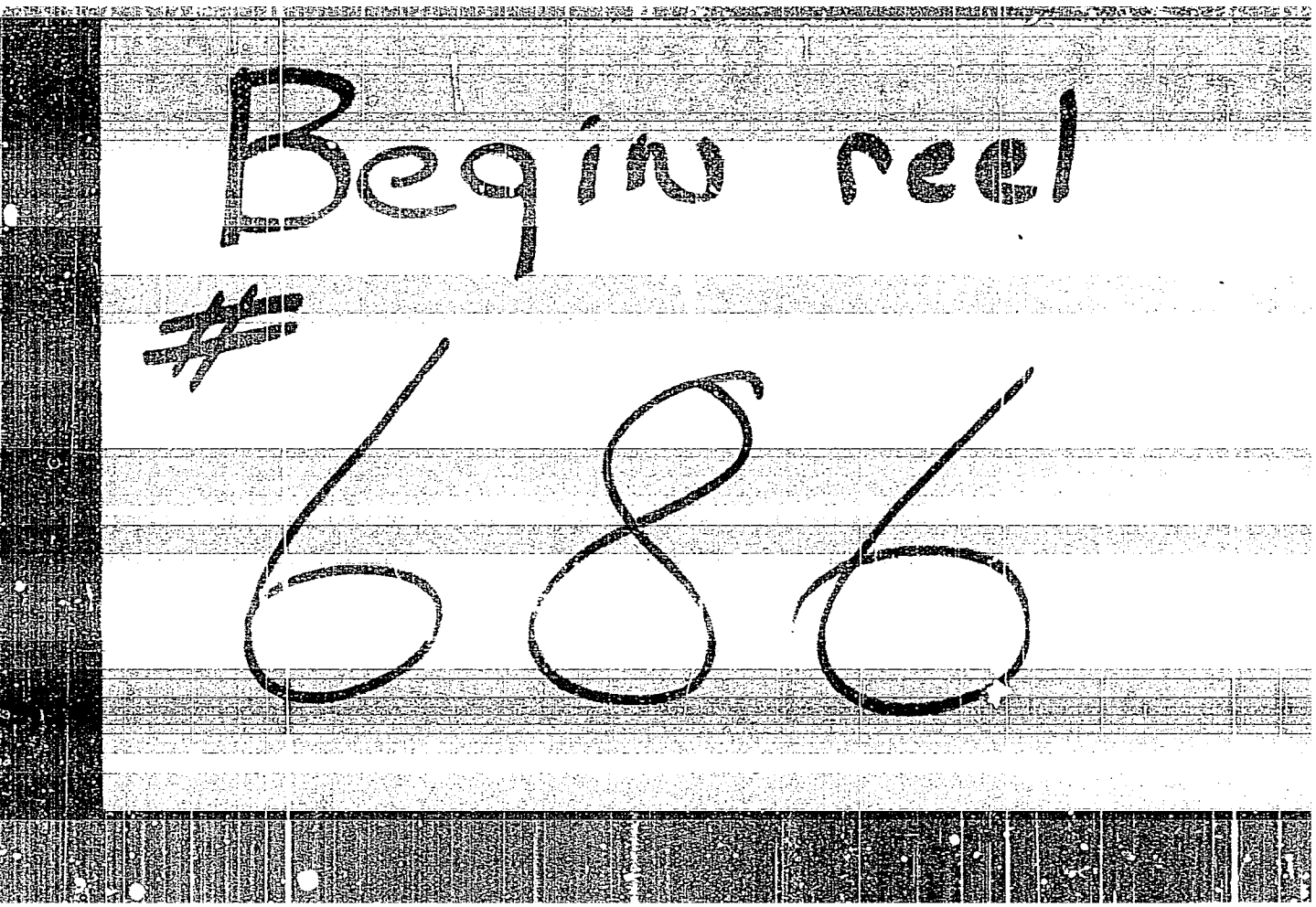

YURASKIN, A.S.

Torsion of the cryptorchid testis and spermatic cord. Khirurgiia 39 no.4:142-143 Ap'63 (MIRA 17:2)

1. Iz khirurgicheskogo otdeleniya (nachal'nik G.M. Prikhod'ko) Perovskoy dorozhnoy bol'nitsy (nachal'nik S.V. Chernysheva) Moskovskoy zheleznoy dorogi.

RAZYGRAYEV, Arkadiy Mikhaylovich [deceased]; YURASOV, A.I., kand. tekhn. nauk, retsenzent; MINSKER, E.I., inzh., red.

[Structural synthesis of the electrical circuits of machine tools] Structurnyi sintez elektroskhem metallorezhushchikh stankov. Moskva, Energiia, 1964. 71 p. (Biblioteka po avtomatike, no.106) (MIRA 17:10)

YURASOV, A.N.

YURASOV, A.N.

On developing structural formulae related to multiple contact systems. Sbor.nauch.rab. Mekh.inst. no.3:125-146 '52. (MLRA 8:3)
(Electric relays)

YURASOV, Alekaey Nikolayevich; LOSSIYEVSKIY, V.L., prof., doktor tekhn. nauk, otv.red.; ARTEMOVA, T.I., red.izd-va; BOBROV, P.G., tekhn.red.

[Remote control. Lecture No.1: Theory of relay networks] Teleupravlenie. Lektsiia pervaia: Teoriia releinykh skhem. Moskva, Vses.zaochnyi politekhn.in-t, 63 p. (MIRA 13:3)
(Remote control) (Switching theory)

S/194/62/000/005/037/157
D222/D309

AUTHOR: Yurasov, A.N.

TITLE: A method of transforming relay circuits with mutually exclusive contacts

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 5, 1962, abstract 5-2-125 i (Sb. statey. Vses. zaochn. politekhn. in-ta, 1960, no. 24, 135-142)

TEXT: A method of constructing relay-contact bridge circuits in which false chains are eliminated by mutually exclusive contacts is examined. The selection of such contacts is carried out by comparing the separate terms of the structural formula, first pairwise, then comparing the pairs, and so on. The following sequence of operation is recommended for circuits containing several reactive organs: 1) The brackets are removed in such a way that each term contains one reactive organ; 2) that pair of terms is selected which contains the largest number of common contacts, and which differs in the mutually-exclusive contacts of one element; the common contacts are put in front of the brackets; 3) analogously, each pair

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A method of transforming relay ... S/194/62/000/005/037/157
D222/D309

is united with a term of the formula which has not yet been united, while the different contacts are transferred to the right-hand side of the formula, and so; 4) the simplifications are carried out according to the rules of switching circuit algebra; 5) the left and right sides of the formula are joined by the sign of multiterminal series connection. An example of circuit design is given. 2 references. [Abstractor's note: Complete translation].

Card 2/2

YURASOV, Aleksey Nikolayevich; IVANOV, V.I., red.; BUL'DYAYEV, N.A., tekhn. red.

[Theory of design of switching circuits]Teoriia postroeniia releinykh skhem. Moskva, Gosenergoizdat, 1962. 117 p. (Biblioteka po avtomatike, no.62) (MIRA 15:10)
(Electric networks) (Electric relays)

IL'IN, Viktor Aleksandrovich; YURASOV, A.N., red.; BUL'DYAYEV, N.A., tekhn. red.

[Telemetering and remote control of distributed objects] Telekontrol' i teleupravlenie raseredotochennymi ob"ektami. Moskva, Gosenergoizdat, 1963. 311 p. (MIRA 17:3)

ROGINSKIY, Vadim Nikolayevich; YURASOV, A.N., red.; LARIONOV, G.Ye., tekhn. red.

[Design of relay control systems] Postroenie releinykh skhem upravleniia. Moskva, Izd-vo "Energiia," 1964. 422 p. (MIRA 17:3)

RAYNES, Roman Lazarevich; GORYANOV, Oleg Aleksandrovich. Prinimal uchastiye ZHOZHIKASHVILI, V.A., kand. tekhn. nauk; SUKHOPRUDSKIY, N.D., kand. tekhn. nauk, retsenzent YURASOV, A.N., red.

[Remote control] Teleupravlenie. Izd.2., perer. Moskva, Energiia, 1965. 535 p. (MIRA 18:2)

ZHILKIN, N.G.; YURASOV, A.V.; TROSTNIKOVA, N.Ya., red. izd-va; IVANOVA, A.G., tekhn. red.

[Safety measures and industrial hygiene in the research institutes and laboratories of geological organizations] Okhrana truda i proizvodstvennaia sanitariia v nauchno-issledovatel'skikh institutakh i laboratoriiakh geologicheskikh organizatsii. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po geol. i okhrane nedr, 1961. 178 p. (MIRA 15:3)
(Laboratories--Safety measures) (Geological research)

YURASOV, G.I.

Nature of injuries of the pelvic bones and organs as result of being run over and struck by a car. Sud.-med.ekspert. no.4:23-25 O-D '65. (MIRA 18:12)

1. Kafedra sudebnoy meditsiny (zav. - dotsent Ye.I.Pakhomova) i kafedra gospital'noy khirurgii (zav. - prof. A.M.Aminev) Kuybyshevskogo meditsinskogo instituta. Submitted August 10, 1964.

YURASOV, I.V., inzh.

Types of diesel engines for tractors and agricultural machinery.
Trakt. i sel'khozmash. no.2:12-15 F '58. (MIRA 12:3)
(Diesel engines) (Tractors--Engines)
(Agricultural machinery--Engines)

YURASOV, R.N., kapitan 3-go ranga; LOSIKOV, V.T., kapitan-leytenant

Strengthen and increase achieved successes. Mor. sbor. 48 no.7:18-23 Jl '65. (MIRA 18:8)

YURASOV, S. I.

YURASOV, S. I. "On the technique of single-moment reaction of the 'sigma' in cases where it is turned", Trudy Sakol. gos. med. in-ta, Vol. II, 1948, p. 183-89.

SO: U-4393, 19 August 53, (Letopis 'Zhurnal 'nykh Statey', No. 22, 1949).

YURASOV, M. M.

FISHMAN, G.M.; LOPATIN, Yu.T.; YURASOV, M.M.

IUrasov machine for removing seeds from apricots. Kons. i ov. prom. 13 no.6:4-5 Je '58. (MIRA 11:5)

1.Batumskiy nauchno-issledovatel'skiy institut konservnoy promyshlennosti (for Fishman, Lopatin). 2. Isfarinskiy konservnyy zavod (for Yarasov).

(Apricots) (Canning industry--Equipment and supplies)

KLENSKIY, A.F.; YURASOV, N.A.; YELISEYEV, A.I.; GARANINA, L.F., red.

[The city of Gorkiy; a concise manual] Gorod Gor'kii; kratkii spravochnik. Gor'kii, Gor'kovskoe knizhnoe izd-vo. 1963. 253 p. (MIRA 17:4)

M)ZHERENKO, A.N., kapitan 1-go ranga; YURASOV, R.N., kapitan-leytenant

Patriotic initiatives should be given an active support and wide propagation. Mor. sbor. 47 no.11:10-13 N '63. (MIRA 16:11)

21423

S/120/61/000/002/038/042
E210/E594

9,6110 (3002, 2605)

AUTHORS: Tul'chinskiy, B. S. and Yurasov, V. D.

TITLE: Humidity Sensor Based on Using a Porous Semiconducting Film

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.2, pp.183-184

TEXT: The sensitive element is a semiconducting tin dioxide film with a porous surface produced by vacuum deposition on a porcelain core (2[illegible] x 5 x 1 mm) after preliminary drying at 150°C for 1 hour. The film porosity and thickness can be easily controlled by varying the pressure and the temperature in the vacuum chamber. Porous tin dioxide films of thicknesses between 100 and 300 Å can also be produced by pyrolysis of tin tetrachloride onto the surface of a porcelain plate heated to 800-900°C and placed in a bell into which vapours of an alcohol solution of tin tetrachloride $SnCl_4 \cdot 5H_2O$ are fed in, together with a stream of dry air. By controlling the speed of feeding-in the mixture, the degree of saturation of the mixture with tin tetrachloride vapours, the duration of the process and the air humidity, porous films of the desired thickness can be obtained. A reliable contact between

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the film and the electrodes is produced by vacuum deposition of thin silver and platinum electrodes. A good contact can also be obtained by soldering with indium without a flux. The dependence of the resistance (lg 1/R vs. φ,%) of the sensor on the relative humidity is plotted in Fig.1; it is reminiscent of the adsorption isotherm of water vapour on porous absorbents (A. Ya. Kuznetsov, Zh.fiz. khimii, 1959, 32, No.6, 1374). There is a jump in the electric conductivity between 30 and 40% of relative humidity, which is attributed to the beginning of capillary condensation in the pores. Absence of hysteresis indicates that the film does not interact with water. Thus, the rectilinear section of curve 1 can be applied for determining relative humidities between 40 and 95% with an accuracy of about 1% compared to psychometric measurements which were applied for calibrating the instrument. On a semilogarithmic plot the temperature dependence is practically linear; at room temperature the temperature coefficient is about 0.86%/°C.
There are 2 figures and 9 references: 8 Soviet and 1 non-Soviet.

[Abstractor's Note: This is a condensed translation.]

SUBMITTED: May 18, 1960

Humidity Sensor Based on ....

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Fig.1

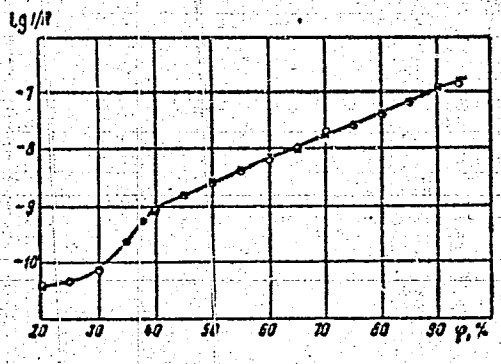
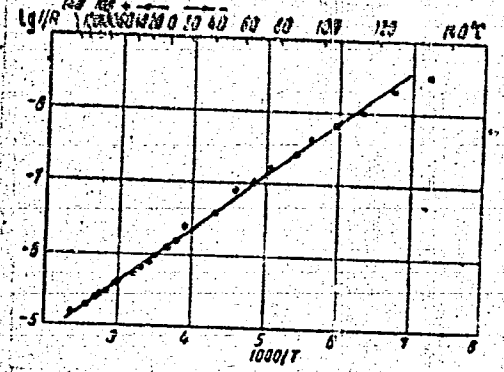


Fig.2



Card 3/3

YURASOV, V.F.

Dynamics of thermal reactions of various organs during perfusion with cold liquids through the cerebral ventricles and subarachnoid space of the spinal cord. Fiziol. zhur. 47 no.4:436-441 Ap '61. (MIRA 14:6)

1. From the Normal Physiology Chair, Medical Institute, Kuybyshev.
(BODY TMEPERATURE) (BRAIN) (SPINAL CORD)

40614

S/239/62/048/004/001/002
I015/I215

AUTHOR: Yurasov, V. F.

TITLE: The temperature of the brain and viscera following cooling of CNS

PERIODICAL: Fiziologicheskiy zhurnal SSSR im. I. M. Sechenova, v. 48, no. 4, 1962, 413–421

TEXT: The problem of the temperature of the various parts of the brain and organs in normal conditions and after cooling of the organism is still a matter of controversy. This is the continuation of a previous study. Acute experiments were performed on 40 dogs. The direct cooling of various parts of CNS was performed by the perfusion technique through the ventricles and subarachnoidal space of the spinal cord (Golovin's method). The temperature of the liver, of muscles of the thigh, of the rectum, of the skin and of the brain at three different levels was measured every 5–10 min. with electrothermometers ЭТУ-М (ETU-M) and "Bioterm". Environmental temperature during the experiments was 18–25°C. The decrease in the temperature is most rapid in the cortex and slowest at the lowest levels of the brain, regardless of the site of cooling of CNS. On the other hand, it was observed that the dynamics of the thermal responses of the viscera and the brain depended on the site of cooling of CNS, although the reaction varied even following cooling of the same site. The rectal temperature did not reflect the degree of hypothermia, parti-

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cularly that of the brain. The thermoregulation is performed by the midbrain and is affected by the corrigating effect of the cortex. The perfusion technique of Golovin enables one to perform local cooling of various parts of CNS. There are 4 figures and 3 tables.

ASSOCIATION: Kafedra normal'noy fiziologii Meditsinskogo instituta, Kuybyshev. (Chair of Normal Physiology, Institute of Medicine, Kuybyshev)

SUBMITTED: February 14, 1961

YURASOV, V.F.

Characteristics of respiration and gas exchange following the cooling of different segments of the central nervous system. Fiziol. zh. SSSR Sechenov 49 no.6:711-718 '63 (MIRA 17:1)

1. From the Department of Normal Physiology, Medical Institute, Kuybyshev.

VSEKHSVYATSKIY, Sergey Konstantinovich [Vsekhsviata'kyi, S.K.], prof.; KAZYUTINSKIY, V.V. [Kaziutyns'kyi, V.V.], red.; YURASOV, V.G. [IUrasov, V.H.], otv. za vypusk

[Contemporary science on the origin and evolution of celestial bodies; data for lectures] Suchasna nauka pro pokhodzhennia i rozvytok nebesnykh til; materialy do lektsii. Kyiv, 1958. 24 p. (Tovarystvo dlia poshyrennia politychnykh i naukovykh znan' Ukrains'koi RSR. Ser.10, no.20). (MIRA 14:1)

(Cosmogony)

YURASOV, V.S.

Vectorcardiogram before and after mitral commissurotomy. Kardiologiia 2 no.5:48-55 S-O '62. (MIRA 15:12)

1. Iz kafedry gospital'noy terapii (zav. - chlen-korrespondent AMN SSSR prof. P.Ye.Lukomskiy) II Moskovskogo ordena Lenina meditsinskogo instituta imeni N.I.Pirogova.
(MITRAL VALVE—SURGERY) (VECTORCARDIOGRAPHY)

YURASOV, V. S.; BULYCHEV, V. V.; FREIGER, V. Ya.

The vectorcardiogram of healthy subjects. Cor vasa 4 no.2:114-124 '62.

1. The Department of Hospital Therapy of the II Moscow Medical Institute (Pirogov Institute), Moscow.

(VECTORCARDIOGRAPHY)

YURASOV, V.S.

Importance of vectorcardiography in the diagnosis of acquired heart defects. Vop.kard. 2-go MMI no.2:305-329 '62.
(MIRA 16:1)

(VECTORCARDIOGRAPHY)(HEART—DISEASES)

BULYCHEV, V.V.; YURASOV, V.S.; PREYGER, V.Ya.

Vektorcardiogram of healthy people and its characteristics in athletes. Vop.kard. 2-go MGMI no.2:289-304 '62. (MIRA 16:1)
(VECTORCARDIOGRAPHY) (ATHLETES)

SOLOV'YEV, V.V.; AKIMOV, Yu.I.; ORLOV, L.L.; YURASOV, V.S.

Diagnosis of tricuspid stenosis. Kardiologiia 5 no.2:35-43 '63 (MIRA 17:2)

1. Iz gospital'noy terapevticheskoy kliniki (dir. - chlen-korrespondent AMN SSSR prof. P.Ye. Lukomskiy) II Moskovskogo meditsinskogo instituta imeni N.I.Pirogova.

YURASOV, V.V., kandidat tekhnicheskikh nauk.

Capacitive compensation of rural lines. Trudy MIKHESKH 3:123-132 '56. (MLRA 10:8)

(Electric lines)

YURASOV, I.V., kandidat tekhnicheskikh nauk, PRONNIKOVA, M.I., kandidat tekhnicheskikh nauk; SERGOVANTSEV, V.T., kandidat tekhnicheskikh nauk; SLEPYAN, Ya.Yu., kandidat tekhnicheskikh nauk, dotsent (Minsk)

"Outages and protection against them in agricultural power networks." V.IU. Gessen. Reviewed by V.V. IUrasov and others. Elektrichestvo no.10:93-95 O '56. (MLRA 9:11)
(Electric engineering)
(Gessen, V.IU.)

YURASOV, V. V.

"The Use of Condensers for the Maintainance of Voltage States in Rural Networks."

Dissertation for the Degree of Candidate of Technical Sciences, defended at Moscow Institute for Mechanization and Electrification of Agriculture. 3 April 1953. (Elektrichestvo, 1958, Nr 4, 92-93)

ARUSTAMYANTS, Isaak Avanesovich; inzh.; ZLATKOVSKIY, A.P., kand.tekhn.nauk; KOZHAIN, I.M., inzh. [deceased]; SKVORTSOV, P.F., kand.tekhn.nauk; YURASOV, V.V., kand.tekhn.nauk; NIKITINA, V.M., red.; FEDOTOVA, A.F., tekhn.red.

[Brief manual on electricity in agriculture] Kratkii spravochnik po elektrifikatsii sel'skogo khoziaistva. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1959. 250 p. (MIRA 13:5)
(Electricity in agriculture)

SERGOVANTSEV, V.T., kand.tekhn.nauk; YURASOV, V.V., kand.tekhn.nauk; ALUKER, Sh.M., kand.tekhn.nauk; ANDRIANOV, V.N., doktor tekhn. nauk; ASTAF'YEV, N.N., kand.tekhn.nauk; BUDZKO, I.A., akademik; BYSTRITSKIY, D.N., kand.tekhn.nauk; VEYALIS, B.S., kand.tekhn. nauk; GIRSHBERG, V.V., inzh.; GORSHKOV, Ye.M., inzh.; GRICHEVSKIY, E.Ya., inzh.; ZAKHARIN, A.G., doktor tekhn.nauk; ZLATKOVSKIY, A.P., kand.tekhn.nauk; IOSIPYAN, S.G., inzh.; ITSKOVICH, A.M., dotsent; KAUFMAN, B.M., inzh.; KVITKO, M.N., inzh.; KORSHUNOV, A.P., inzh.; LEVIN, M.S., kand.tekhn.nauk; LOBANOV, V.N., dotsent; LITVINENKO, A.F., inzh.; MERKELOV, G.F., inzh.; PIRKHAVKA, P.Ya., kand.tekhn.nauk; PRONNIKOVA, M.I., kand.tekhn.nauk; SMIRNOV, B.V., kand.tekhn.nauk; FATYUSHENKO, S.G., inzh.; KHODNEV, V.V., inzh.; SHCHATS, Ye.L., kand.tekhn.nauk; EBIN, L.Ye., doktor tekhn.nauk; ENTIN, I.A., kand.tekhn.nauk; SILIN, V.S., red.; SMELYANSKIY, V.A., red.; BALLOD, A.I., tekhn.red.; SMIRNOVA, Ye.A., tekhn.red.

[Handbook pertaining to the production and distribution of electricity in agriculture] Spravochnik po proizvodstvu i raspredeleniiu elektricheskoi energii v sel'skom khoziaistve. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1959. 900 p. (MIRA 13:2)

1. Vsesoyuznaya akademiya sel'skokhozyaystvennykh nauk imeni V.I.Lenina (for Budzko).
(Rural electrification)

Yurasov, Y. V.

JURASZOV, J.V. mernok; ÉHEI, Sandor, dr. [translator]

Diesel engine type number of tractors and agricultural machines; a polemic article. Jarmu mezo gep 6 no.1:2-5 '59.

BERZIN, A.A., inzh.; BORODIN, I.F., kand. tekhn. nauk; LUKOVNIKOV, A.V., kand. tekhn. nauk; PRONNIKOVA, M.I., kand. tekhn. nauk; SERGOVANTSEV, V.T., kand. tekhn. nauk; YURASOV, V.V., kand. tekhn. nauk; BURGUCHEV, S.A., zasl. deyatel' nauki i tekhniki RSFSR doktor tekhn. nauk, prof., red.; NIKITINA, V.I., red.; SOLODENIKOVA, G.A., red.; SOKOLOVA, N.N., tekhn. red.

[Course on elelctric power plants, substations, and power systems] Praktikum po elektricheskim stantsiiam, podstantsiiam i sistemam. [By] A.A.Berzin i dr. Moskva, Sel'khozizdat, 1963. 303 p. (MIRA 16:12)

(Electric power plants)
(Electric power distribution)

YURASOVA, G.M.; ZINOV'YEVA, L.D.

Complexometric determination of barium in barite ores.
Sbor.trud. VNIITSVETMET no.9:53-56 '65.
(MIRA 18:11)

SAYUN, M.G.; YURASOVA, G.M.; IVANOVA, R.G.; MASHUKOV, A.Ya.

Xylenol orange in the complexonometric determination of lead in lead concentrates. Zav.lab. 27 no.8:961-963 '61. (MIRA 14:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy gornometallurgicheskiy institut tsvetnykh metallov.
(Lead--Analysis)

YURASOVA, Mariya Kliment'yevna; TRET'YAK, G.A., kand. geograf. nauk, red.; SHEVCHUK, L.V., red.; KHOLODUL'KIN, A.A., tekhn. red.

[The river course] Put' reki. Omsk, Omskoe oblastnoe knizhnoe izd-vo, 1958. 282 p. (MIRA 14:10)
(Irtysh Valley--Economic geography)

YURASOVA, Mariya Kliment'yevna; DMITRIYEVA, L.A., red.; ROZEN, E.A., tekhn. red.

[On the shores of the Irtysh River] Na beregakh Irtysha. Moskva, Izd-vo "Sovetskaia Rossiia," 1959. 142 p. (MIRA 14:11)
(Irtysh Valley--Cities and towns)

GARANIN, N.P., red.; LASHEVICH, V.I., red.; SURIKOV, N.I., red.; URAZAYEV, A.K., red.; FISENKO, V.A., red.; YURASOVA, M.K., red.; MEL'NIKOV, V.I., tekhn. red.

[Handbook and guide to the Irtysh and the lower part of the Ob' Valley] Putevoditel'-spravochnik po Irtyshu i Nizhnei Obi. Omsk, Omskoe knizhnoe izd-vo, 1960. 156 p. (MIRA 14:10)

1. Irtyshskoye otdeleniye nauchno-tekhnicheskogo obshchestva vodnogo transporta (for all except Yurasova, Mel'nikov).
(Irtysh Valley—Guidebooks) (Ob' Valley—Guidebooks)

ZAGORETS, P.A.; YURASOVA, T.I.

System $HClO_4 - C_4H_8O_2 - H_2O$. Zhur.neorg.khim. 10 no.11:2554-2558 N '65. (MIRA 18:12)

1. Submitted May 9, 1964.

YURASOVA, T.S.

BELYAYEV, I.I., professor; BUDRIN, R.N., professor; YURASOVA, T.S., vrach; KOZLOVA, T.V., vrach; POPOV, V.S., vrach

Hygienic problems in the formation and utilization of Gorkii Reservoir. Gig. i san. 22 no.4:61-64 Ap '57. (MLRA 10:9)

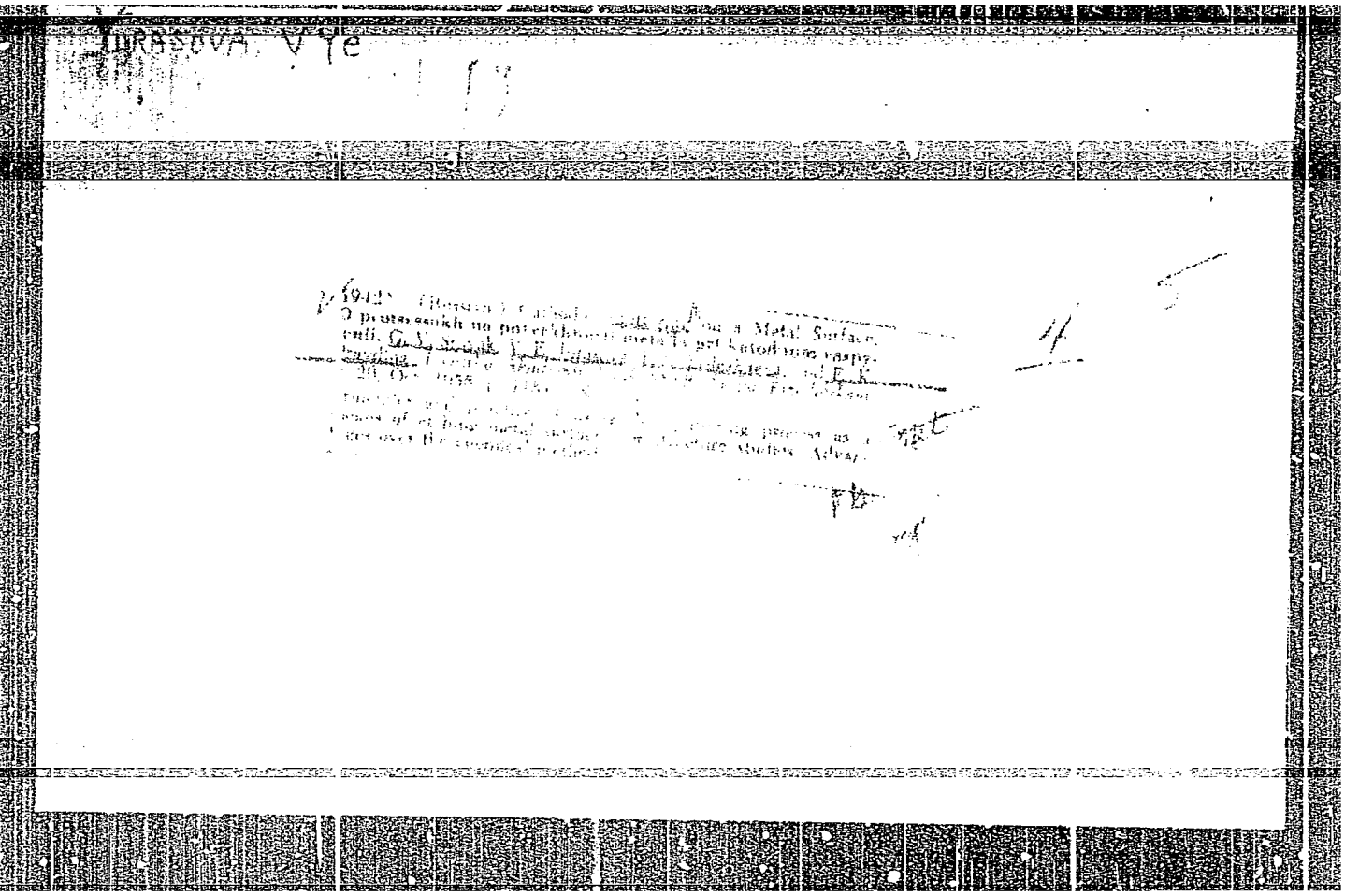
1. Iz Gor'kovskogo meditsinskogo instituta imeni S.M.Kirova.
(WATER SUPPLY,
creation & utilization of watershed (Rus))

KOSHENKO, A.M., YURASOVA, V.N., DVOYNIKOV, D.T., GARDER, V.G.

Aerosynoptic conditions causing spring and fall frosts in Turkmenistan. Trudy Sred.-Az. nauch.-issl. gidrometeor. inst. no.1:133-155 '59. (MIRA 13:8)
(Turkmenistan--Frost)

YURASOVA, V.N.; KOSHENKO, A.M.; BEZUGLOVA, V.A.

"Garmsil'a" in Turkmenia. Trudy Sred.-Az.nauch.-issl.gidrometeor. inst. no. 8:109-124 '63. (MIRA 17:5)



YURASOVA, V. YE.

120-2-29/37

AUTHOR: Spivak, G. V., Yurasova, V. Ye., Kushnir, F. F. Prilezhayeva, I. N.

TITLE: Installation for metal etching by means of Ion Bombardment (Ustanovka dlya Travleniya Metallov Ionnoy Bombardirovkoy (UIT-1)).

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No. 2, pp. 105 - 110 (USSR).

ABSTRACT: Cathode sputtering has lately been widely applied to structure investigation of metals, alloys and dielectrics (Ref. 1). Its advantages compared with chemical plating have been discussed in Reference 2. Technical details of such installations have been described in References 3 and 4. In the present article the authors give the description of the UIT-1 (УИТ-1) installation, thought to be much more efficient than the existing ones, mainly because of the availability of necessary conditions for plating at high temperatures. Similarly to the installation described in Reference 3, the UIT-1 (УИТ-1) permits accelerated sputtering of a particular sample under forced regimes at high potentials and, similarly to that described in Reference 4, permits evaporation in a gaseous stream. Compared with other types, UIT-1 (УИТ-1) has the following advantages. It permits simultaneous sputtering of three

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Installation for Metal Etching by Means of Ion Bombardment.

samples (as compared with one in the installation described in References 3 and 4; this enables rapid evaluation of the best conditions for ion plating. A special arrangement for inserting the heated sample is provided, enabling the temperature to be monitored. The temperature may be varied between 100 and 700°C. It is also possible to plate already plated samples with deposits of quartz or metal without introducing air under the bell-jar thus preventing oxidisation of samples. The general view of the installation is given in Figure 1. It consists of a vacuum system (Fig. 2) and power supplies (Fig. 3). The apparatus for simultaneous plating of three samples is shown in Figure 4. Their shape may be arbitrary, with the maximum dimension of the surface to be plated of 20 x 20mm. For accelerated etching at temperatures near room temperature a special insert is provided at the apex of the glass bell-jar (Fig. 6). It is stressed that UIT-1 (УИТ-1) assures good control of the etching and plating processes and a swift change from one operation to another, e.g. the deposition of quartz or metal films on to a sample may begin one minute after the finish of sputtering; changing of sputtered samples takes no more than 15 minutes.

Installation for Metal Etching by Means of Ion Bombardment. 120-2-29/37

The analysis of the ion bombardment etching and of the applicability of the cathode sputterer to the analysis of the grain boundaries and of the surface relief structures of metals and alloys have been discussed in Reference 2. The following have co-operated with the authors in the design of the device: I.P. Bulanova, A.I. Klenova, A.I. Krokhina, N.A. Pereverzev, V.V. Potekhin and T.F. Filippova. Four photographs and three schematic diagrams are given. There are 5 references, 3 of which are Slavic.

SUBMITTED: December, 25, 1956.

ASSOCIATION: Faculty of Physics of the Moscow State University imeni M. V. Lomonosov. (Fizicheskiy Fakul'tet MGU im M. V. Lomonosova.)

AVAILABLE: Library of Congress.

Card 3/3

YURASOVA, V. Ye.

AUTHOR: Yurasova, V. Ye. 70-6-10/12

TITLE: The Formation of Oriented Figures in the Ionic Bombardment of Metals (Obrazovaniye orientirovannykh figur pri ionnoy bombardirovke metallov)

PERIODICAL: Kristallografiya, 1957, Vol.2, No.6, pp. 770 - 775 (USSR).

ABSTRACT: The advantages of cathodic sputtering as a method obtaining oriented figures on the surfaces of metals are mentioned and conditions for the best results are indicated. Slip planes in single crystals can be detected. The mechanism of the process is discussed. The advantages over chemical etching are: 1) there is no need to choose a suitable etch for each metal. 2) Cathodic sputtering can be used at any temperature from 20 ^{o} to 0.6 of the melting temperature of the metal. Strains can therefore be removed if required. 3) After cathodic sputtering the surface of the metal is not covered with a layer of oxide and therefore the specimen is suitable for further electron microscopic examination. 4) By changing the kinds of ions used and the voltage and current regimes the depth of the etching can be controlled. To find the best conditions the 513 face of an aluminium single crystal was subjected to bombardment with neon ions. The voltage was 2 000 across the tube at a current

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The Formation of Oriented Figures in the Ionic Bombardment of Metals.

density of 1.2 mA/cm^2 and a pressure of 10^{-2} mm Hg. Bombardment lasted 3 hours. Flats corresponding to the 110 planes were developed. (These have the greatest reticular density). After 10 hours the pattern lost its sharpness. Further tests suggested that the conditions quoted are optimum except that the pressure should be 10^{-1} mm Hg. Conditions for a range of metals are quoted in detail. On crystals of Cd slip planes are disclosed by bombardment. Regularities in the behaviour of various metals under this glow discharge are found: 1) Certain metals, for example, Al, show oriented pits of one form or another and oriented hillocks are not found (when there is a net loss of material from the cathode). 2) On the closestpacked planes of certain metals pits are formed and on others hillocks. On the 0001 planes of Bi hexagonal raised regions are formed but on the 0001 of Zn hexagonal pits appear. 3) Under certain conditions pits and hillocks may be produced simultaneously, for Cd, for example. Various theories of the process are discussed but none is found very satisfactory; besides the evaporation of atoms there is surface diffusion and the re-deposition of material on the surface to be considered.

Acknowledgments to A.V. Shubnikov, G.V. Spivak and V.R. Regel'.

There are 6 figures, 1 table and 10 references, 4 of which are

Card2/3 Slavic.

The Formation of Oriented Figures in the Ionic Bombardment of Metals. 70-6-10/12

ASSOCIATION: Moscow State University (Moskovskiy Gosudarstvennyy Universitet im. M.V. Lomonosova)

SUBMITTED: February 21, 1957.

AVAILABLE: Library of Congress.

Card 3/3

SPIVAK, G. V. , YURASOVA, V. Ye., and SHISHKINA, Ye. I.

(Moscow Univ.)

"An Original Method of Exposure of Magnetic Heterogeneity in Metal."

paper presented at the All-Union meeting on Magnetic Structure of Ferromagnetics June 1958, in Krasnoyarsk. Meeting sponsored by Inst. of Physics, Acad. Sci. USSR, and Comm. for Magnetism, Dept Phys-Math Sci, AS USSR,

SOV/137-58-10-21474D

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 144 (USSR)

AUTHOR: Yurasova, V. Ye.

TITLE: On the Processes of Cathodic Atomization of Single Crystals and Polycrystals of Metals (O protsessakh pri katodnom raspylenii metallicheskikh mono- i polikristallov)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Physical-Mathematical Sciences, presented to the MGU (Moscow State University), Moscow, 1958

ASSOCIATION: MGU (Moscow State University), Moscow

1. Single crystals---Processing 2. Metal crystals---Processing

Card 1/1

ALEKSEYEVA, A.P.; BASALAYEVA, N.Ya.; YELINSON, M.I.; ZERNOV, D.V.; KUL'VARSKAYA, B.S.; LIFSHITS, T.M.; SAVITSKAYA, Ya.S.; SEMA, L.A.; SHABEL'NIKOVA, A.E.; YURASOVA, V.Ye.

Eighth all-Union conference on cathode electronics. Radiotekh. i elektron. 3 no.8:1092-1102 Ag '58. (MIRA 11:9)
(Cathodes)

AUTHOR: Yurasova, V. Ye. SOV/57-28-9-16/33

TITLE: Modern Theories of Cathode Disintegration and the Micro-Relief of the Destroyed Metal Surface (ovremennyye teorii katodnogo raspyleniya i mikrorel'yef razrushayemoy poverkhnosti metalla)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Vol 28, Nr 9, pp. 1966-1970 (USSR)

ABSTRACT: First a short survey covering the modern theories of cathode disintegration is given. The problem is approached whether a correlation could be established between the disintegration coefficient and the crystallographical orientation when the target is irradiated by fast ions. A copper monocrystal was investigated for information bearing on this problem, its cubic suface being used as a target for crypton ions generated in a plasma with a high density and low pressure. An additional ionisation is caused by the emission of the oxide cathode. The evidence found was that the deposit from the disintegrated substance does not follow a cosine distribution, but that it consists of individual specks. The ions were accelerated through about 1000 to 4000 Volts. Additional experiments in which a copper monocrystal was vaporized (at about 950°C) showed that the deposit distribution from an evaporation of a (100) sur-

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Modern Theories of Cathode Disintegration/and the Micro-Relief of the Destroyed Metal Surface SOV/57-23-9-16/33

face follows a cosine curve independently from the initial state of the surface. When, however, it is etched by means of an ion bombardment always a typical pattern is established. This fact indicates an essential difference between the mechanisms of cathode disintegration and of vaporization. Moreover, it appears that the directional emission of the particles caused by an ion bombardment cannot be explained by secondary surface phenomena. The predominant disintegration of the substance along certain simple crystallographic orientations is apparently caused by the mechanism of ion etching. There is every indication that the existing theories of cathode disintegration offer no means for the explanation of the evaporation versus orientation function at high velocities obtained in this work. G. M. Protopopova, who is preparing for her diploma assisted in the work. A. P. Komar and N. D. Morgulis made substantial contributions to it. It was supervised by T. F. Spivak. There are 4 figures and 11 references, 4 of which are Soviet.

Card 2/2

Moscow State Univ

SOV/126-7-6-14/24

AUTHORS: Spivak, G.V., Yurasova, V.Ye., Klenova, A.I. and Vlasova, T.A.

TITLE: On the Exposure of the Structure of Metals by Gas Ion Bombardment

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 6, pp 893-898 (USSR)

ABSTRACT: In order to show the possibilities of revealing the metal structure of a heated material by a cathode sputtering method, the authors investigated several characteristic alloys. Atomizing of the specimens at a definite temperature was carried out in the apparatus for the ionic etching of metals UIT-1 used by Spivak et al.(Ref 3), in which there is a special device for heating the specimen (from 100 to 700°C) and for measuring its temperature. Sheet specimens of an Al-Mg alloy (6% Mg) were submitted to ion bombardment at 500°C. Cathode sputtering (together with selective evaporation which takes place at such a temperature) reveals the grain boundaries of an Al-Mg alloy (6.5% Mg) heated to 500°C. In Fig 1b the surface of this alloy, etched with neon ions at 280°C and in Fig 1a the structure of the same alloy revealed by cathode sputtering at 500°C are shown. From a

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comparison of these photographs it can be seen that at 500°C the grain size of the alloy is considerably coarser and the grain boundaries are finer. Apart from this alloy, etching of specimens of steel YalT was studied with the apparatus UIT-1. In this case, chromium carbides precipitated along the grain boundaries at 500°C. The presence of chromium carbides after chemical etching is only apparent from the holes where the carbides were attacked. By means of ionic etching at 600°C the chromium carbide precipitates along the grain boundaries could be seen in the form of small dark spheres of approximately 1 to 2μ diameter. A photograph of the surface of steel YalT specimens etched at 600°C and subsequently cooled is shown in Fig 2. In Fig 3 ferrite and austenite grains revealed as a result of cathode sputtering of the steel YalT are shown. In Fig 4 the structure of pure aluminium sheet is shown (a - after chemical etching; b - after etching by ion bombardment). The extent to which the metal structure is revealed can be best judged by the depth of etching of the intergranular boundary. Therefore, in order to select the correct

sputtering treatment, the dependence of the depth of metal grain boundary etching on the parameters of the gas discharge during simultaneous sputtering was studied. The depth of the boundaries was measured by a stereoscopic method. A quartz print was taken from the atomized surface of the specimen and a precise portion of this print was photographed in the electron microscope UEM-100 under an angle of +6 and -6° relative to the optical axis. The stereo-couples obtained (Figs 5a and b) were studied with the precision stereometer SM-3, which gives the volume effect. In order to obtain more reliable results, the atomizing of the grain boundary was studied in neon and in air for several types of technical copper with two different instruments. Ionic etching of the specimens was carried out initially in a glass tube. The investigated specimen was used as the cathode in the tube. During atomizing, the specimen temperature was kept constant by cooling it with water. The dependence of the depth of etching of the grain boundary on the potential difference between the cathode and anode during atomizing in neon was determined. The density of the discharging current

was kept constant ($j = 10$ mA/cm^2). The results of the measurements carried out are shown by the curve 3 in Fig 6. The dependence of the depth of etching of the grain boundaries on the density of the discharging current was studied on two types of specimens which were cut out from technical copper of somewhat different compositions. The density of the discharging current varied between 5 and 15 mA/cm^2; the potential difference between the electrodes was kept constant at 5 kW. The specimen was atomized for 5 mins. The dependence of the depth of etching of the grain boundaries on the density of the discharging current was found to be linear (Fig 7). From an analysis of the curves obtained for the dependence of the depth of etching of the intergranular metal boundaries on the density of the discharging current and on the potential difference between the electrodes it is possible to arrive at the following conclusions: there is no advantage in raising the potential difference between the cathode and the anode above 8-9 kW to accelerate revealing the metal structure. It is better for the density of the discharging current to be increased. The greatest permissible density of the

On the Exposure of the Structure of Metals by Gas Ion Bombardment SOV/126-7-6-14/24

discharging current in cathode sputtering of metals is determined by the intensity of the cooling rate of the specimen. In the case under consideration, in which the atomized specimens were cooled in a mixture of dry ice and alcohol, a current density exceeding 15 mA/cm^2 should not be used. However, at a more intensive cooling rate, greater discharging currents can be used. The best operating conditions for atomizing technical copper are: j = 10 mA/cm^2, u = 9 kW, t = 5 min, p = 5 x 10^{-2} mm Hg col. There are 7 figures and 7 references, 5 of which are Soviet, 1 English and 1 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova (Moscow State University imeni M.V.Lomonosov)

SUBMITTED: January 25, 1957 (Initially)
November 12, 1957 (After revision)

Card 5/5

ACCESSION NR: AP4045302

S/0048/64/028/009/1470/1473

AUTHOR: Oliva, V.Ya

TITLE: Anisotropic reflection of bombarding ions from the surface of a single crystal. Report: Tenth Conference on Cathode Electronics held in Kiev, 1-18Nov63

SOURCE: AN SSSR. Izvestiya. Serija fizicheskaya, v.28, no.9, 1964, 1470-1473

TOPIC TAGS: cathode sputtering, single crystal, copper, argon

ABSTRACT: The angular distribution of normally incident ions reflected from a (100) face of a face-centered copper crystal was calculated. The incident ions were assumed to be of moderate energy (a few keV) and to have the same mass as the copper atoms. Only the trajectories of those ions were calculated that left the target after two collisions with lattice atoms. The collisions were treated as collisions between rigid spheres, and the collision radii were calculated using the Borsenal Coulomb potential, employed by J.B.Gibson, A.N.Goland and G.H.Vineyard (Phys.Rev. 120,121 [illegible]). The numerical and graphical methods employed to calculate the ion trajectories are described in some detail. Trajectories were computed for "hundreds of ions" initially distributed over a 45° sector in the vicinity of a target atom.

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L 10611-65
ACCESSION NR: AP4045302

It was found that minimum numbers of particles are reflected in the [110] and [100] directions, and maximum numbers in the directions of loose packing lying between these axes. There are in all eight directions of maximum reflections; these are inclined at 20° to the normal ([100] axis) and are distributed at 45° intervals in azimuth. Similar calculations were performed for the reflection of 2 kev argon ions from a copper crystal. The results were qualitatively similar to those for ions equal in mass to the target atoms, and are reported to be in good agreement with the experimental data of V.Ye.Yurasova, V.A.Brzhezinskiy and G.M.Ivanov (Zhur.eksp. i teor.fiz.46,No.2,1964). Orig.art.has: 5 formulas and 4 figures.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta (Physics Department, Moscow State University)

SUBMITTED: 00

SUB CODE: NP,AP

NR REF SOV: 002

ENCL: 00

OTHER: 007

3/3

AUTHORS: Yurasova, V. Ye., Spivak, G. V., Kushnir, F. F. SOV/48-23-6-19/28

TITLE: Methods for the Development of the Structure of Metals and Alloys by Ion-bombardment (Metodika vyyavleniya struktury metallov i splavov ionnoy bombardirovkoy)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 6, pp 744 - 749 (USSR)

ABSTRACT: In the first part of the present paper ion-etching of the granular boundaries and of the structural composition of the alloys are investigated within a large temperature interval. First, the advantages of cathodic spraying as against chemical etching and thermal evaporation in a vacuum are pointed out. One of the most important advantages is the possibility of carrying out structural investigations within a large temperature interval. For visual investigation and for photographing a special attachment was constructed (Fig 1). Seven pictures are then shown of aluminum bronze (Figs 2,3), which were taken after various forms of thermal treatment by ion-spraying and cathodic spraying and 350-fold enlargement. The first series of pictures

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distinctly show the formation of the martensite structure in the three ranges of temperature, whereas the second series shows the structural grains at various temperatures. In the second part of the paper the destruction of the surface of the structural grains of polycrystals or of monocrystals by ion-bombardment is investigated. First, the fact is pointed out that by the investigation of the symmetric indentations our knowledge of the mechanism of cathode-spraying has been extended, and that new possibilities of applying ion bombardment may now be found. It follows from the pictures (Fig 5) that the symmetry of orientated indentations agrees with the orientation of the surface of a monocrystal. In the following, the influence exercised by the increase of ion energy is investigated and explained on the basis of figure 5. The results obtained make it possible to assume that the orientated indentations may form in the course of ion-etching. There are 5 figures and 7 references, 5 of which are Soviet.

ASSOCIATION: Fizicheskiy fakul'tet [illegible]skogo gos. universitet im. M. V. Lomonosova (Physics Depa[illegible] of Moscow State University imeni M. V. Lomonosov)

YURASOVA, V. Ye.; PLESHIVTSEV, N.V.; ORFANOV, I.V.

Directed emission of particles in the sputtering of copper single crystals by ion beams with energies up to 50 Kev. Zhur. eksp.i teor.fiz. 37 no.4:966-972 O '59.
(MIRA 13:5)

1. Moskovskiy gosudarstvennyy universitet.
(Sputtering (Physics)) (Copper crystals)

YURASOVA, V. Ye.

71

PHASE I BOOK EXPLOITATION SOV/5526

Vsesoyuznoye soveshchaniye po magnitnoy strukture ferromagnetikov, Krasnoyarsk, 1958.

Magnitnaya struktura ferromagnetikov; materialy Vsesoyuznogo soveshchaniya, 10 - 16 iyunya 1958 g., Krasnoyarsk (Magnetic Structure of Ferromagnetic Substances; Materials of the All-Union Conference on the Magnetic Structure of Ferromagnetic Substances, Held in Krasnoyarsk 10 - 16 June, 1958) Novosibirsk, Izd-vo Sibirskogo otd. AN SSSR, 1960. 249 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fiziki Sibirskogo otdeleniya. Komissiya po magnetizmu pri Institute fiziki metallov OFMN.

Resp. Ed.: L. V. Kirenskiy, Doctor of Physical and Mathematical Sciences; Ed.: R. L. Dudnik; Tech. Ed.: A. F. Mazurova.

PURPOSE: This collection of articles is intended for researchers in ferromagnetism and for metal scientists.

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Magnetic Structure (Cont.) SOV/5526

COVERAGE: The collection contains 38 scientific articles presented at the All-Union Conference on the Magnetic Structure of Ferromagnetic Substances, held in Krasnoyarsk in June 1958. The material contains data on the magnetic structure of ferromagnetic materials and on the dynamics of the structure in relation to magnetic field changes, elastic stresses, and temperature. According to the Foreword the study of ferromagnetic materials had a successful beginning in the Soviet Union in the 1930's, was subsequently discontinued for many years, and was resumed in the 1950's. No personalities are mentioned. References accompany individual articles.

TABLE OF CONTENTS:

S/070/60/005/003/020/024/XX
E132/E460

AUTHORS: Yurasova, V.Ye., Pavlovskaya, E.A., Tyapunina, N.A. and Predvoditelev, A.A.

TITLE: The Application of Ionic Etching For Showing Up Dislocations in Metallic Crystals

PERIODICAL: Kristallografiya, 1960, Vol.5, No.3, pp.437-440 + 1 plate

TEXT: Etching is the most widely used method of revealing the emergence of dislocations at a crystals surface and is usually chemical or electrolytic. To show the dislocations successfully it is essential that impurities should be concentrated in them giving a Cottrell atmosphere. The method of ionic etching has been studied as it has the advantage of producing no superficial oxidation and of being usable over a wide temperature range. Dislocations are shown up by the selective sputtering of ions from the disturbed places in the lattice. Cadmium crystals have been used with zinc as the decorating impurity. Sputtering was carried out in a glow discharge in air or neon at 10^{-1} to 10^{-2} mm Hg. The best conditions were found to be: current density 20 ma/cm^2, voltage 1500 to 2000, duration 20 min and pressure 10^{-1} mm Hg.

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S/070/60/005/003/020/024/XX
E132/E460

The Application of Ionic Etching for Showing Up Dislocations in Metallic Crystals

Electrolytic etching of the same specimens was carried out for comparison. The results show a very close correspondence between the two methods. A particular dislocation configuration is quantitatively analysed. Acknowledgments are expressed to Professors G.V.Spivak and Ye.G.Shvidkovskiy for their interest in the work and to V.L.Indenbom for useful advice. There are 5 figures and 9 references: 4 Soviet and 5 English.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (Moscow State University im. M.V.Lomonosov)

SUBMITTED: September 9, 1959

Card 2/2

YURASOVA, V. Ye.

Reports presented at the 5th Intl. Conference on Ionization Phenomena in Gases. Munich, 28 August - 1 September 1961.

a. G A Bazilevskaya, A M Andrianov, V F Demichev and V I Vasilyev

"Investigation of a Pulse Discharge in a Hollow Cylindrical Gas Sheath"

b. B G Brezhnev Ya S Maksimov

"Energy Measurements of Fast Electrons Formed During a Powerful Pulse Discharge" Chamber

c. A S [illegible], A A Zaydel, and G A Malyshev

"On a Method of Spectralisotopic Investigation of the Hydrogen Discharge Chamber Walls Interactions"

d. V F Kitayeva N N Sobolev

"On the Hydrogen Lines Broadening Under the Carbon Arc and Detonation Wave Conditions"

e. S G Alikhanov R A Demirkhanov, A V Komin, G G Podlesnyy, G L Khorasanov

" An Investigation of Plasma Diffusion in the Magnetic Field"

f. V S Komelkov, Yu V Skvortsov V N Tereshchenko G S Tserevitinov

"Dynamical Current Cord"

g. N N Sobolev

"A Spectroscopically Studied State of Gases Following the Detonation Wave"

h. R N Ilin, Ye S Solovyev N V Fedorenko

"Molecular Hydrogen Ionization by Gas Hydrogen Atoms"

i. I P Flaks, O N Osmirtsov

"Ionization of Gases Induced by Multi-charged Ions"

j. P M Morozov, L N Pilyugov

"The Source for Molecular Hydrogen Ions Formation at the Ogra Device"

k. A L Bezbatchenko V V Kuznetsov N P Malakhov N N Semashko

"Injection of an Ionic Beam into the Ogra Magnetic Trap"

l. V Ye Yurasova

"On Directed Emission of Particles from a Copper Single Crystal Sputtered by Bombardment with Ions"

33

S/058/61/000/012/054/083
A058/A101

AUTHORS: Spivak, G.V., Shishkina, Ye.I., Yurasova, V.Ye.

TITLE: Concerning a method for detecting magnetic inhomogeneities

PERIODICAL: Referativnyy zhurnal. Fizika, no. 12, 1961, 383, abstract 12E684 (V sb. "Magnitn. struktura ferromagnetikov", Novosibirsk, Sib. otd. AN SSSR, 1960, 191 - 194)

TEXT: The feasibility was demonstrated of detecting magnetic inhomogeneities on the surfaces of ferromagnetics by means of chemical etching. The indicated method is based on the fact that ions in solution that have a magnetic moment are drawn into the region with the highest magnetic-field gradient. The most effective etchants and etching conditions were found by the trial-and-error method. Using the described method, an electron-microscope image was obtained of magnetic inhomogeneities in an artificial specimen built up of alternate Permendure and Mo bands, as well as an image of natural magnetic inhomogeneities in martensitic needles in steel.

[Abstracter's note: Complete translation] N. Sedov

Card 1/1

YURASOVA, V. Ye., SHROIENKO, I. G., and BUKHANOV, V. M.

"On the peculiarities of the anisotropy of the monocristal cathode sputtering.

report submitted for the Colloquium CNRS on Ionic Bombardement ,National Center of Scientific Research , Bellevue, 4-8 December 1961.

24803
S/048/61/025/006/003/010
B117/B212

9,4300

AUTHORS: Spivak, G. V., Kushnir, F. F., and Yurasova, V. Ye.

TITLE: УИТ-3 (UIT-3) installation for etching metals, semiconductors and dielectrics through ion bombardment

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25 no. 6, 1961, 707 - 712

TEXT: The present paper has been presented at the 3rd All-Union Conference on Electron Microscopy, held in Leningrad from October 24 to 29, 1960. It describes a new model of a technical installation of type УИТ-3 (UIT-3) for etching metals, semiconductors, and dielectrics through ion bombardment. The models UIT-1 and UIT-2 have been described in Refs. 1 and 2 (Spivak G. V., Yurasova V. Ye., Kushnir F. F., Prilezhayeva I. N., Pribory i tekhnika eksperim., № 2, 106 (1957); Yurasova V. Ye., Spivak G. V., Kushnir F. F., Izv. AN SSSR, Ser. fiz., 23, 744 (1959)). The UIT-3 installation is designed for the following investigations of the surface structure of materials under different conditions: 1) heating of a sputtered specimen not above 1200°C; 2) cooling of the specimen during

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УИТ-3 (UIT-3) installation...

etching with running water; 3) observation of the object surface during sputtering or evaporation by using an optical system with a long focal length; 4) expansion or compression of the specimen during ionic etching or evaporation; 5) application of quartz or metal foils (necessary for the subsequent electron-optical study of the powdered surface) right after ionic etching of the specimens. The UIT-3 installation consists of the following main components: system for generating and measuring the vacuum, feeding device, control console, device for expansion and compression of the specimens, metallographic microscope and a device to sputter and heat the specimens. The vacuum system of UIT-3 is analogous to that of UIT-1. The electric system consists of the following main components: high-tension rectifier for 10 kv and 50 ma; heating current transformer (7 v, 250 a) with a device to transfer the potential either to heat or evaporate the specimen; platinum-platinum-rhodium or chromel-alumel thermo couples with a millivoltmeter for measuring the temperature of the specimen; device for measuring the vacuum and turning on the pumps; interlocks which switch off the high tension when the doors of the installation are opened. Fig. 2 shows a diagram of the UIT-3 installation. The shape of the specimens to be sputtered may be arbitrary if no load is applied. The maximum size of a

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УИТ-3 (UIT-3) installation...

specimen bombarded with ions should not exceed 30 × 30 × 8 mm. When the specimen is heated up to 1200°C it should not be larger than 20 × 20 × 2 mm. During sputtering a specimen having a maximum cross section of 20 mm^2 and a length of 60 mm can be expanded or compressed under a load of 400 kg. Right after the ionic etching a quartz, metal, or carbon foil can be put on the specimen. The ionic etching may create impressions at the edges of the monocrystals which have the symmetry of these edges. The oriented figures, which are obtained by cathode sputtering and corresponds to the symmetry of the surface where they are located, may be used to determine roughly the indices of simplest crystal edges. The application of ionic etching seems very promising to visualize dislocations, especially for heated specimens if chemical etching cannot be used. There are 4 figures and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc.

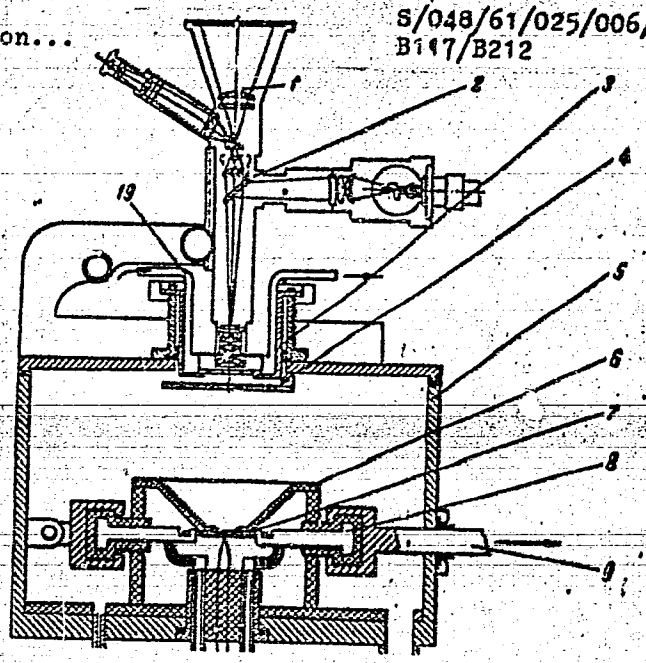
ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gos. universiteta im. M. V. Lomonosova (Division of Physics of Moscow State University imeni M. V. Lomonosov)

Card 3/6

24803

S/048/61/025/006/003/010
B117/B212

УИТ-3 (UIT-3) installation...



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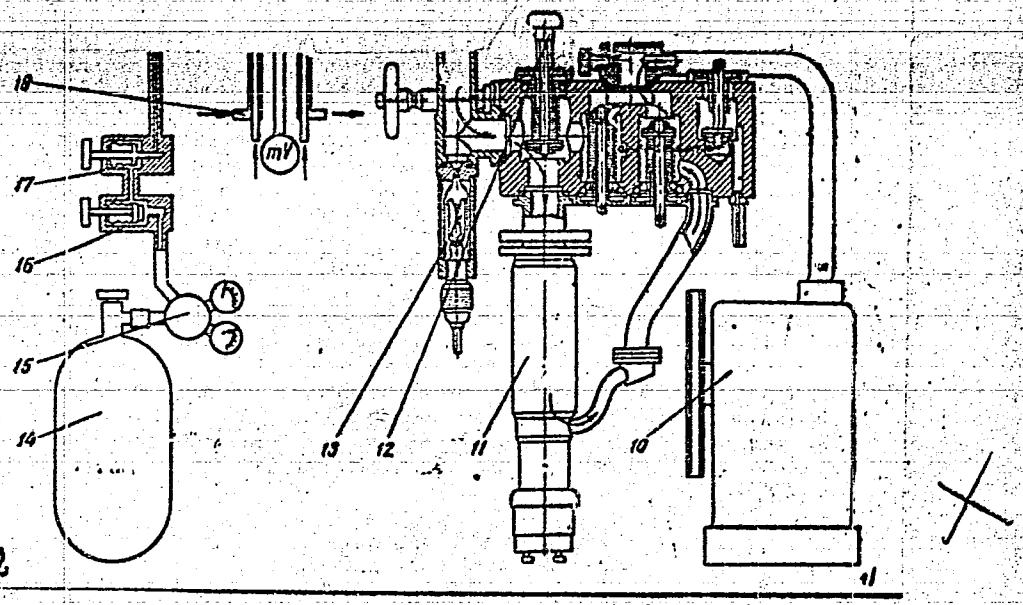
24803
S/048/61/025/006/003/010
B117/B212

УИТ-3 (UIT-3) installation ...



Card 5/6 Fig. 2

УИТ-3 (UIT-3) installation...

Legend to Fig. 2: 1) microphoto-attachement МНФ-2 (MNF-2); 2) metal microscope МВТ(MVT); 3) movable container with quartz glass; 4) shield; 5) working chamber; 6) ceramic shield of the specimen; 7) specimen with thermocouple; 8) specimen holder with insulator; 9) bolt for transferring the mechanical load to the specimen; 10) forepump ВН-461 (VN-461); 11) diffusion pump ЦВЛ-100 (TsVL-100); 12) vacuum cutoff valve; 13) steam-gauge tube ЛТ-2 (LT-2); 14) gas container with inert gas; 15) gas reducer; 16) gas cock; 17) needle valve; 18) cooling system for the specimen contacts; 19) cooling system for the quartz glass.

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S/056/61/041/005/004/038
B104/B108

26,2340

AUTHORS: Yurasova, V. Ye., Sirotenko, I. G.

TITLE: Cathode sputtering of single-crystal balls

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1359-1364

4

TEXT: Cathode sputtering of single-crystal balls of copper, tungsten, chromium, cobalt, germanium, iron, and an indium-antimony alloy has been carried out in a plasma of low pressure and high density (crypton pressure $\sim 5 \cdot 10^{-3}$ mm Hg). The ball-shaped specimens had a diameter of from 3 to 6 mm. During sputtering, the specimens were on a negative potential of from 1 to 10 kv. Current density was 5-7 ma/cm^2, in some experiments even 13-15 ma/cm^2. The sputtered substances were collected on spherical or cylindrical surfaces. The direction of emission of the sputtered particles was determined. From diamond-type or face-centered cubic lattices, the substances were chiefly sputtered in the [110] and [100] directions. From body-centered cubic lattices, the substances were chiefly sputtered in the [111] and [100] directions. The precipitation

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spots obtained from single-crystal balls were more distinct than those obtained from sputtering of plane single crystals. The precipitation spots of substances with face-centered lattice were the clearest. The precipitation intensity of substances with diamond lattice varies from the center of the spot to its boundary nearly according to the cosine law. The precipitation intensity of substances with other lattice types decreases more rapidly from the center to the boundary. The sharpness of the precipitation spots increases with increasing sputtering coefficient, atomic number of the sputtered target, and temperature, and with decreasing lattice constant. The authors thank professor G. V. Spivak for discussions and V. M. Bukhanov for assistance in the experiments. There are 4 figures, 1 table, and 10 references: 1 Soviet and 9 non-Soviet. The 4 most recent references to English-language publications read as follows: E. B. Henschke, J. Appl. Phys., 28, 411, 1957; R. H. Silsbee, J. Appl. Phys., 28, 1246, 1957; G. H. Gibson et al., Phys. Rev., 120, 1229, 1960; G. H. Vineyard, V. B. Gibson, Bull. Am. Phys. Soc., 5, 26, 1960.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: April 27, 1961

Card 2/2

YURASOVA, V.Ye.; BUKHANOV, V.M.

Anisotropy of cathode sputtering of a copper monocrystal as a function of its temperature. Kristallografiia 7 no.2:257-260 Mr-Ap '62. (MIRA 15:4)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Sputtering (Physics)) (Copper crystals--Thermal properties)

BALASHOVA, A.P.; GOR'KOV, V.A.; ZHDAN, A.G.; KUL'VARSKAYA, B.S.; PARILIS, E.S.; POLYAKOVA, M.A.; YURASOVA, V.Ye.; YASNOPOL'SKIY, N.L.

Tenth Congress on Cathode Electronics. Radiotekh. i elektron 7 no.7:1258-1272 '62. (MIRA 15:6)
(Electronics—Congresses)

S/126/62/014/004/013/017
E193/E383

AUTHORS: Tyapunina, N.A., Predvoditelev, A.A., Yurasova, V.Ye., Gusarova, S.M. and Zakharov, V.M.

TITLE: Distribution of impurities and dislocations in cadmium crystals

PERIODICAL: Fizika metallov i metallovedeniye, v. 14, no. 4, 1962, 582 - 588

TEXT: It has been established by Borovskiy et al (Kristallografiya, 1962, 7, no. 4) that zinc tends to segregate at dislocations in cadmium crystals, the points of emergence of idslocations on the surface of a polished specimen being revealed by etching pits. It has also been found that in some specimens two systems of etch figures can be observed, their dimensions being about 1 - 2 μ and about 0.1 μ, respectively. The object of the present investigation was to elucidate the causes of the appearance of these two systems of etch figures by studying the effect of the zinc concentration on the size and shape of the etching pits. The concentration of zinc in the experimental cadmium-zinc alloy specimens ranged from 0.01 - 10%. Electrolytic

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and ion-bombardment etching techniques were used to produce the etching pits. The etch figures were examined with the aid of an optical microscope in the case of alloys containing less than 4% Zn, an electron microscope being also used to examine the alloys with lower Zn contents. In some cases, cine-photography was employed to study the process of formation of etch figures. The angle between the surface of the polished specimen and the basal plane (0001) of cadmium ranged from 0 - 90°. Rows of small etching pits were observed in specimens with the zinc content lower than 1%. Both small and coarse etching pits were formed as the zinc concentration increased. In specimens with 4% Zn the formation of isolated hexagonal pits was observed. Starting from the zinc concentration of 6%, plate-like pits of regular hexagonal shape formed in the (0001) plane were observed only. The density of the small and coarse etch figures was practically independent of the zinc concentration, which supported the view that the etch pits corresponded to the points of emergence of the dislocations on the surface of the specimens. The results of measurements of the etch pits formed on various alloys are reproduced in Fig.6, where the relative number ($n_i / \Sigma n_i$) of pits in a given specimen

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is plotted against the etch-pits dimensions (d, μ), the various graphs relating to alloys with the Zn content indicated. Comparison of these distribution curves with the constitution diagram of the cadmium/zinc system shows that alloys with a Zn content lower than the limit of its solid solubility in Cd at room temperature are characterized by one system of (small) etch figures. Two systems of etch figures are formed in two-phase alloys, each with a characteristic size of etching pit. It can be postulated that the system of the coarse etch figures cornesponds to dislocations decorated by the second-phase precipitates, whereas the fine etch figures correspond to dislocations with increased solute concentration, i.e. to Cottrell atmospheres. The results of the present investigation were taken as a proof that the presence of dislocations considerably affected the distribution of Zn in the alloys studied.
There are 6 figures and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University im. M.V. Lomonosov)

SUBMITTED: October 2, 1961

L2429

S/048/62/026/011/021/021
B125/B102

26.2332

AUTHORS: Yurasova, V. Ye., and Murinson, E. A.

TITLE: Peculiarities of anisotropy in the cathode sputtering of single crystals

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 11, 1962, 1445-1448

TEXT: The anisotropy of hexagonal crystals is studied on cylindrical zinc single crystals with the basal plane (0001). The most densely packed directions (11$\bar{2}$0) were perpendicular to the cylinder axis. The specimen (of about the same height and diameter) was attached to a glass tube and surrounded by a glass or mica collector. The glass tube contained a low pressure plasma (10^{-3} mm Hg) of high density (10^{13} cm^{-3}). The test conditions are described by V. Ye. Yurasova and I. G. Sirotenko (Zh. eksperim. i teor. fiz., 41, 1359 (1961)). Zinc is best sputtered as follows: current density at the specimen 1 ma cm^{-2}, negative voltage at the specimen 1.2 - 1.3 kv, krypton pressure $5 \cdot 10^{-3}$ mm Hg, time of sputtering 1 hr. The substance of hexagonal crystals, like that of cubic crystals, is mainly atomized in the direction of the densest packing.

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Cathode sputtering of zinc single crystals onto a cylindrical glass collector supplied sufficiently distinct spot patterns. The intensity of these spots decreases from the center toward the spot margin according to $I/I_0(\alpha) = e^{-p_0 \sin^2\alpha} \cdot \cos\alpha$, where $p_0 = 9.5$ for Zn, and $p_0 = 3.3$ for Cu in Kr. In the evaporation of a monocrystalline copper sphere (d = 4 mm) and at ratios $\mu = d/l$ between 0.1 and 0.33, the photometric curves remain nearly constant, and resemble the curves for the plane specimen. d is the diameter of the sphere, and l is the distance between collector and specimen. The angular size of the spot is $\tan(\delta/2) = \tan(\delta_0/2) + \mu/2$ for a plane specimen, where δ_0 is the angular size of the atomized spot when the collector is infinitely distant. The linear size $D_0 \approx 2e \tan(\delta_0/2) + d_0$ of the spot decreases with decreasing distance to the collector, but always remains greater than the diameter of the plane specimen. The linear size of the sputtered spot remains smaller than the specimen diameter in the case of spherical specimens and spherical collectors when the screen is sufficiently near ($\mu = 0.5$). This is due to

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the dependence of the single crystal sputtering intensity in the densely packed direction on its angle of inclination φ toward the direction perpendicular to the surface. The sputtering intensity reaches its maximum at $\varphi = 0$, and decreases by about 35% to. $\varphi = 30^{\circ}$. There are 4 figures. References to G.K. Wehner, J. Appl. Phys. 26, No 1056 (1955) and to G.S. Anderson, G.K. Wehner, J. Appl. Phys. 31, 2305 (1960).

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gos. universiteta im. M. V. Lomonosova (Physics Division of the Moscow State University imeni M. V. Lomonosov)

Card 3/3

S/181/63/005/002/024/051
B104/B102

AUTHORS: Predvoditelev, A. A., Spivak, G. V., Kotova, A. M., Yurasova, V. Ye., and Kushnir, F. F.

TITLE: Study of non-decored dislocations in zinc single crystals by ion bombardment

PERIODICAL: Fizika tverdogo tela, v. 5, no. 2, 1963, 542-545

TEXT: This paper is aimed to prove the possibility of detecting "virgin" dislocations by ion bombardment of single-crystal faces. Cylindrical zinc single crystals (2.5 mm in diameter, 50 mm high) were split along the (0001) plane at nitrogen temperature and the faces were bombarded with ions in flowing neon gas. Thin pieces of specimens that had been bombarded with ions on both (0001) planes showed the same etch patterns on both sides. Repeated etching of any one surface section produces no new etch patterns but intensifies those existing. The results from chemical etching and from ion bombardment are consistent. The most favorable experimental conditions are: neon pressure between $6 \cdot 10^{-2}$ and

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S/181/63/005/002/024/051
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$3 \cdot 10^{-2}$ mm Hg, voltage between anode and specimen between 1.5 and 1.75 kv, current density at the specimen 1.2 a/cm^2, bombardment period, approximately one hour. There are 5 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 23, 1962 (initially)
August 29, 1962 (after revision)

Card 2/2

SPIVAK, G.V.; YURASOVA, V.Ye.; KUSHNIR, F.F.

UIT-r apparatus for fast etching of metals, semiconductors, and dielectrics by ionic bombardment. Izv. AN SSSR. Ser. fiz. 27 no.9:1188-1192 S '63. (MIRA 16:9)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. Lomonosova.
(Electronic apparatus and appliances) (Ion beams)

YURASOVA, V. Ye.; LEVIKINA, L. M.; BRZHEZINSKIY, V. A.

"Elektronenmikroskopische Untersuchung dunner Halbleiterschichten von Typ $A_{III}B_{V}$, erzeugt mittels Kathodenzerstaubung."

report submitted for 3rd European Regional Conf, Electron Microscopy, Prague, 26 Aug-3 Sep 64.

L 8817-65 EWT(l)/EWG(k)/EWT(m)/EPA(sp)-2/EPF(n)-2/EPA(w)-2/T/EEC(b)-2/
EWA/EWP(q)/EWP(b) Pz-6/Pab-24/Pad/Pu-4 IJP(c)/APTL/ASD(a)-5/ESD(gp)/
ESD(t)/RAEM(t) JD/EW/GG/AT
ACCESSION NR: AP4045291 S/0048/64/028/009/1411/1415

AUTHOR: Spivak, G. V. (Doctor of physicomathematical sciences); Yurasova, V. Ye.; Rozhkova, O. A.; Nikitina, T. N.

TITLE: Properties of thin Permalloy films obtained by cathodic sputtering

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 28, no. 9, 1964, 1411-1415

TOPIC TAGS: thin film, thin Permalloy film, cathode sputtered film, sputtered film magnetic property

ABSTRACT: A study has been made of the magnetic characteristics (important for the magnetic memory-element operation) of thin Permalloy [79% Ni] films, varying in thickness from 300 to 1000 Å, deposited by cathodic sputtering on a glass substrate at 200C with a magnetic field superimposed in the substrate plane. The results of the study showed that the coercive force H_c decreases with increasing film thickness d. The rate of decrease is similar to, but higher than, that observed

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ACCESSION NR: AP4045291

in vapor-deposited films. The films deposited with a superimposed magnetic field of 150 oe had the lowest H_c. The dependence of the anistropy field H_k on d was similar to that for H_c; it decreased with increasing d and was at a minimum in films deposited with a superimposed magnetic field of 150 oe. A maximum H_k was obtained with a superimposed field of 235 oe. The film saturation induction B_s varied from 11,000 to 7000 gs, regardless of d. The hysteresis-loop rectangularity coefficient $K = B_r/B_s$, where B_r is the residual magnetization, deviates from unity with d increasing to 700 Å and beyond. The deviation is probably caused by a rather low anistropy in films of such thickness. At the maximum reverse magnetic field H_r of 10 oe, the film required from 20 to 45 nsec for reverse magnetization. The reverse magnetization time decreased linearly with decreasing film thickness d. Electron microscopic examination showed that the films have a polycrystalline structure with an fcc lattice. Orig. art. has: 3 figures.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta (Department of Physics, Moscow State University)

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